

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An antenna system ~~of the type used in a handheld electronic device, said the antenna system~~ comprising:
 - an antenna element; and
 - a ground plane comprising:
 - at least two conducting surfaces each having a plurality of sides defined by at least one edge;
 - at least one conducting strip connecting ~~said the~~ the at least two conducting surfaces for allowing current to flow between ~~said the~~ the at least two conducting surfaces; ~~and~~
 - ~~said wherein the at least one conducting strip being is~~ the narrower than the width of any of ~~said the~~ the at least two conducting surfaces[.];
 - wherein the ground plane is disposed in a plane substantially parallel to a plane of the antenna element; and
 - wherein the ground-plane comprises at least one of a space-filling-curve shape and a multilevel structure~~contributes to the radiation performance of the antenna system by increasing a number of frequency bands of the antenna system so as to enhance a multiband behavior of the antenna system.~~
2. (Currently Amended) The antenna system according to claim 1, wherein ~~said the~~ the at least two conducting surfaces are on a common planar or curved surface.
3. (Currently Amended) The antenna system according to claim 1, wherein:
 - two edges of the at least two conducting surfaces are ~~placed~~ substantially parallel to each other, and ~~said~~
 - the at least one conducting strip connecting ~~said the~~ the at least two conducting surfaces is placed substantially centered with respect to the gap defined by ~~said the~~ the two substantially parallel edges.
4. (Currently Amended) The antenna system according to claim 1, wherein:
 - the ~~ground-plane~~ ground plane includes at least three conducting surfaces, in which one pair of any of two adjacent conducting surfaces ~~are~~ is connected by means of at least one conducting strip[.]; and
 - ~~the~~ remaining pairs of adjacent conducting surfaces are electromagnetically connected by means of a capacitive effect or by direct contact provided by the at least a conducting strip.
5. (Currently Amended) The antenna system according to claim 4, wherein ~~said the~~ the strips are substantially aligned along a straight axis.
6. (Currently Amended) The antenna system according to claim 4, wherein ~~said the~~ the strips are not aligned along a straight axis.
7. (Currently Amended) The antenna system according to claim 1, wherein ~~said the ground-plane~~ ground plane comprises ~~includes~~ at least two conducting strips, ~~said the~~ the at least two

conducting strips connecting at least two of ~~said the at least two~~ conducting surfaces at least at two points located at ~~both~~ edges of ~~said the~~ at least two conducting surfaces.

8. (Currently Amended) The antenna system according to claim 1, wherein at least one of ~~said the~~ at least one conducting strip is aligned along ~~one of the edges~~ an edge defining an external perimeter of ~~said the ground plane~~ ground-plane.

9. (Currently Amended) The antenna system according to claim 1, ~~said the~~ ground-plane comprising a plurality of conducting surfaces on the same planar or curved surface, wherein at least two of ~~said the~~ conducting surfaces are connected by a conducting strip.

10. (Currently Amended) The antenna system according to claim 1, wherein each pair of the at least two adjacent conducting surfaces are connected by at least one conducting strip.

11. (Currently Amended) The antenna system according to claim 1, wherein all the conducting surfaces defining ~~said the ground plane~~ ground-plane have a substantially rectangular shape, ~~said the conducting surfaces~~ rectangular-shapes being sequentially aligned along a straight axis, each pair of ~~rectangular-shapes~~ the conducting surfaces defining a gap therebetween ~~between them~~, at least two opposite edges of at least one of ~~said the~~ gaps being connected by at least one of the at least one conducting strip.

12. (Currently Amended) The antenna system according to claim 1, wherein:
all of the at least two conducting surfaces defining ~~said the ground plane~~ ground-plane have the same horizontal width and are sequentially aligned along a straight vertical axis;
~~wherein~~

each pair of adjacent conducting surfaces of the at least two conducting surfaces define a gap between them, therebetween;

~~wherein~~ each pair of adjacent conducting surfaces of the at least two conducting surfaces are connected across ~~said the~~ gap by a conducting strip of the at least one conducting strip;

~~;~~ said the strip being is aligned along an edge of the external perimeter of ~~said the ground plane~~ ground-plane, ~~said~~

the edge of the external perimeter is being alternatively and sequentially chosen at the right and left sides with respect to a vertical axis crossing the center of the ~~ground plane~~ ground-plane.

13. (Currently Amended) The antenna system according to claim 1, wherein at least one of the at least one conducting strip ~~connecting two of said conducting surfaces~~ is shaped as a zigzag or meandering curve.

14. (Currently Amended) The antenna system according to claim 1, wherein:
at least one of the conducting surfaces or at least one of the conducting strips of ~~said the ground plane~~ ground-plane is shaped as a space filling curve (SFC), ~~said the~~ SFC including at least ten connected straight segments; ~~and, wherein said~~

the at least ten connected straight segments are smaller than a tenth of the operating free-space wave length and are spatially arranged in such a way that no two adjacent and connected segments form another longer straight segment.

15. (Currently Amended) The antenna system according to claim 14, wherein ~~said~~ the at least ten connected straight segments intersect at ~~the~~ tips of the SFC.

16. (Currently Amended) The antenna system according to claim 14, wherein the SFC ~~includes~~ comprises a plurality of corners formed by each pair of adjacent segments of the at least ten connected straight segments, the plurality of corners each being rounded.

17. (Currently Amended) The antenna system according to claim 14, wherein the SFC is periodic along a fixed straight direction of space if the period is defined by a non-periodic curve ~~that includes~~ comprising at least ten connected segments and no pair of ~~said~~ the adjacent and connected segments define a straight longer segment.

18. (Currently Amended) The antenna system according to claim 14, ~~wherein at least one portion of the antenna system is shaped as a SFC~~, wherein ~~said~~ the SFC has a box-counting dimension larger than one, ~~said~~ the box-counting dimension is computed as the slope of the straight portion of a log-log graph, wherein ~~such~~ the straight portion is a straight segment over at least an octave of scales on the horizontal axis of the log-log graph.

19. (Currently Amended) The antenna system according to claim 1 14, wherein the SFC comprises at least one of a Hilbert, Peano, SZ, ZZ, HilbertZZ, Peanoinc, Peanodec, or PeanoZZ curve.

20. (Currently Amended) The antenna system according to claim 14, wherein at least one of the at least one conducting strip ~~strips connecting two conducting surfaces~~ is shaped as a SFC.

21. (Currently Amended) The antenna system according to claim 1, wherein at least two of ~~said~~ the at least two conducting surfaces are connected by at least two ~~or more~~ conducting strips of different length.

22. (Currently Amended) The antenna system according to claim 14, wherein at least two of ~~said~~ the at least two conducting surfaces define a gap, at least a portion of the gap being shaped as a SFC.

23. (Currently Amended) The antenna system according to claim 14, wherein at least half of the surface area of ~~said~~ the ground-plane is formed by a strip, ~~said~~ the strip being shaped as a SFC.

24. (Currently Amended) The antenna system according claim 1, wherein:

~~at least a portion of said ground plane is a multilevel structure,~~ the multilevel structure ~~including~~ comprises a set of conducting polygons, ~~said the~~ polygons each having the same number of sides;

~~wherein said the~~ polygons are electromagnetically coupled by means of either a capacitive coupling or ohmic contact; ~~wherein~~

a contact region between directly connected polygons is narrower than half of the perimeter of said polygons in at least seventy-five percent of said polygons defining the conducting ~~ground plane~~ ground plane.

25. (Currently Amended) The antenna system according to claim 1, wherein the perimeter of ~~said at least one of the ground plane~~ ground plane, ~~and the conducting surfaces, or both the~~ perimeter of said ground plane and the conducting surfaces are is square, rectangular, triangular, circular, semi-circular, elliptical, or semi-elliptical.

26. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is included in a handheld wireless device.

27. (Currently Amended) The antenna system according to claim 1, wherein the antenna system ~~includes~~ comprises a microstrip patch antenna.

28. (Currently Amended) The antenna system according to claim 1, wherein the antenna system ~~includes~~ comprises a planar inverted-F antenna (PIFA).

29. (Currently Amended) The antenna system according to claim 1, wherein the antenna system ~~includes~~ comprises a monopole antenna.

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Currently Amended) The antenna system according to claim 1, wherein the antenna system ~~includes~~ comprises a multiband antenna.

34. (Currently Amended) The antenna system according to claim 1, wherein the antenna system is used to provide coverage in at least one of a cellular network[[,]] and a wireless local area network (WLAN) ~~or both~~.

35. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is mounted inside a rear-view mirror of a motor vehicle to provide coverage in a cellular network, a wireless local area network (WLAN) or both.

36. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is mounted inside a keyless door lock operation device.

37. (Currently Amended) The antenna system according to claim 1, ~~characterized in that said~~ wherein the antenna system ~~includes~~ comprises a radiating element having substantially the same shape as the ground plane ~~ground-plane~~, ~~said the~~ radiating element being located parallel or orthogonal to ~~said the ground plane~~ ground-plane.

38. (Previously Presented) The antenna system according to claim 1, wherein the antenna system is included in a cellular telephone, a cordless telephone, a personal digital assistant (PDA), a wireless paging device, an electronic game device, or a remote control.

39. (Currently Amended) The antenna system according to claim 1, wherein the ~~ground-plane~~ ground plane is included in a handheld wireless device and ~~wherein~~ the antenna device includes a microstrip patch antenna configuration or a planar inverted-F (PIFA) antenna configuration.

40. (Currently Amended) The antenna system according to claim 1, wherein opposing edges of adjacent conducting surfaces of the at least two conducting surfaces are linear in shape and disposed one from the other in a generally parallel spaced relationship.